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ABSTRACT

The Water in Africa Project was realized over a 2-year period by a team of Peace Corps volunteers. As part of an expanded, detailed design, resources were collected from over 90 volunteers serving in African countries, photos and stories were prepared, and standards-based learning units were created for K-12 students. This unit, "Water-Borne Illnesses," teaches students how water becomes contaminated with specific water-borne diseases. Students read personal accounts of unsafe water and work together to brainstorm solutions to the water problems of African communities. Intended for use with students in grades 10-12, the unit can be used in health and geography classes. Five to ten class periods of 45 minutes each are suggested. The unit lists materials needed, outlines applicable standards, provides essential questions, and gives student objectives. It details day-by-day procedures, assessment activities, and follow-up/enrichment activities. (BT)

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Water-Borne Illnesses

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http://www.peacecorps.gov/wws/water/africa/lessons/

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Water in Africa is a project of Peace Corps World Wise Schools.

2000

Funded through a grant from the Department of Education, the Water in Africa project was realized over a two year period by a team of Peace Corps Volunteers, World Wise Schools' (WWS) classroom teachers, and WWS staff members. Inspired by an idea of one creative WWS teacher, the project eventually expanded into a detailed design. The development and implementation of the design included the collection of resources from over 90 Volunteers serving in African countries, the preparation of those photos and stories, and the creation of standards-based learning units for K-12 students.

Water-Borne Illnesses

Description:

In America, people take clean, safe drinking water for granted. In many countries of the world, water carries a variety of diseases. In this unit, students will learn about how water becomes contaminated with specific water-borne diseases, read personal accounts of unsafe water, and work together to brainstorm solutions to the water problems of communities in Africa. This unit was created in collaboration with the Office of Ground Water and Drinking Water at the Environmental Protection Agency.

Timeframe: Five to ten 45-minute class periods depending on teacher choice

Curricular Areas: Health, Geography

Grade Level: Grades 10-12 particularly with under-prepared or second language learners

Materials

- Internet Access
- Poster Board, Markers, Glue
- "Decision Process for Drinking Water"[www.epa.gov/safewater/kids/games] (Environmental Protection Agency)
- "Water Contamination Experiment" [www.awwa.org/bluethumb/WaterExp1.htm] (American Water Works Association) and the supplies listed on this experiment
- "Water Treatment Path" at http://www.epa.gov/safewater/kids/treat.html
- "Water Filtration" at http://www.epa.gov/safewater/kids/filter.html
- Vignettes about Health and Sanitation from Water in Africa Web site link to resources section http://www.peacecorps.gov/wws/water/africa/lessons/
- Health and Nutrition Stories by Peace Corps Volunteers Serving in Africa
- Evaluation Rubric

Standards

Health Standard 2-- Knows environmental and external factors that affect individual and community health

Benchmark- Knows how personal health can be influenced by society (e.g., culture) and science (e.g., technology)

Benchmark-- Knows how individuals can improve or maintain community health (e.g., becoming active in environmental and economic issues that affect health, assisting in the development of public health policies and laws, exercising voting privileges)

Health Standard 8-- Knows essential concepts about the prevention and control of disease

Benchmark-- Understands the social, economic, and political effects of disease on individuals, families, and communities

Geography Standard 6-- Understands that culture and experience influence people's perceptions of places and regions

Benchmark- Understands how individuals view places and regions on the basis of their stage of life, sex, social class, ethnicity, values, and belief systems

Benchmark- Knows ways in which people's changing views of places and regions reflect cultural change

Geography Standard 16-- Understands global development and environmental issues
Understands why policies should be designed to guide the use and management of Earth's resources and to reflect multiple points of view (e.g., the inequities of access to resources, political and economic power in developing countries, the impact of a natural disaster on a developed country vs. a developing country)

Essential Questions

How can natural resources affect health?

Do all cultures look at resources in the same way?

Objectives

At the end of a one-week lesson, students will be able to:

- identify common water-borne illnesses, their symptoms, prevention, and treatment
- understand how cultural traditions can make illness prevention difficult

Procedure

Procedure: Day One

1. Talk in general about water-borne illness to activate student's prior knowledge and build a schema for understanding the vignettes. Has anyone in the class ever been sick because of water? (Maybe "Montezuma's revenge on a trip to Mexico, or an infection from swimming in polluted water, but for the most part most Americans won't have experienced much in the way of water-borne illness.) Is it a problem in America? Is it a problem in other countries? (25,000 people die every day around the world due to water-related disease.) Why is it so much less of a problem in America than in other countries? (Access to clean ground water, infrastructure to clean water and keep it away from contaminants, etc.

2. Tell students that the unit they are about to begin will look at two essential questions. How can natural resources affect health? Do all cultures look at resources in the same way? Display these questions in a prominent place for the remainder of the unit. The unit will concentrate on the natural resource of water.

3. Tell students that they will be looking at the drinking water quality in the United States and in several countries in Africa. Introduce them to the "Decision Process for Drinking Water" produced by the Environmental Protection Agency. Have them look at the worksheet and read the questions beneath each graphic. Point out that these same decisions need to be made about safe drinking water no matter where the water is—in Africa or the United States.

4. Break the class up into small working groups that they will return to throughout the unit. Tell them to use "Decision Process for Drinking Water" in their small groups and discuss where along this path of decision making there might be some health concerns for safe drinking water. After a short discussion in their groups, each group should report back to the class. It will be likely that student will see that in each decision area (Source, Transport, Treatment, Testing, Delivery, Home) there may be chances for people's health to be affected.

5. Ask students if they know the source of the drinking water, and the location of the water treatment plants in your area. It is likely that most students will not know the exact source, so list all of their guesses and assumptions on a chart or overhead that can be kept for the next class period.

6. Tell students that for homework they are to find out the source of the water for their area, and the location of the water treatment plants. The following hints might be given: (1) Ask your parents to see a water bill, then see if the billing agent has a web site that gives you the information; (2) Check out the EPA web site at www.epa.gov/safewater/ and follow links till they reach information on drinking water Consumer Confidence Reports.

Procedure--Day Two

1. Have students report their findings about the source of your water and the location of the treatment plants. Look back at the list made on the previous class period and compare their assumptions to the reality.

2. Tell students that in this class period they will be involved in conducting an experiment to demonstrate how ground pollutants can affect the source of water. Follow the procedures as listed on the lesson plan from the American Water Works Association "Water Contamination Experiment". Be sure to use the debrief after the experiment is complete with questions like these:
   - What types of things if poured on the ground, or left on the ground near a water source would affect it?
   - What might be the greatest pollutant to the water in our area?
   - How can you prevent people from contaminating the water source?

3. For homework, have students research the Safe Water Drinking Act. [http://www.epa.gov/safewater/sdwa25/25years.html] They should look for the 1996 amendments to the act, and find out what it says about contamination of drinking water sources. Students can find information on the Internet at www.epa.gov/safewater/sdwa25/25years.html. or they can call the Safe Drinking Water Hotline at 1-800-426-4791.

Procedure--Day Three

1. Note: If possible, meet with students in the computer lab or media center where students can have access to the Internet.

2. Discuss the homework from the previous class with the students. They should have found out that, in 1996, an amendment was passed to the Safe Water Drinking Act that included a statement saying that States will be examining all drinking water sources to identify contaminant threats and determine susceptibility to contamination, allowing water suppliers, local governments, and citizens to design source water protection measures.

2. Tell students that today they will investigate how drinking water is treated to remove contaminants. Explain that the Environmental Protection Agency has set up an explanation of this for younger children that they will look at before downloading an experiment from the EPA Web site. Have them go to http://www.epa.gov/safewater/kids/treat.html and investigate the water treatment path. This is an interactive site that explains the basics of a water treatment system.

3. After students have had a chance to "play" with the water treatment path, have them go to http://www.epa.gov/safewater/kids/filter.html and read about how to complete an experiment to demonstrate a water filtration system that includes aeration, coagulation, sedimentation, filtration and disinfection. You may choose to have students build this model themselves or follow your demonstration. Alternatively, you might assign this building to groups as a project to be completed outside of class time.

Procedure--Day Four

1. Review the water treatment processes with students, and then ask them how they think water-related diseases are killed. (Boil water, filter it, or add chemicals such as chlorine or iodine.)

2. Tell them that they will begin to read about water related illnesses in various countries in Africa. Prior to reading, briefly discuss the different ways that people have of getting water. The vignettes refer to bore holes and pumps. A bore hole is a drilled down to an underground aquifer lined with pipe with a pump on top. This understanding is helpful in understanding the vignettes. For example, bore holes are less likely to be contaminated by animals than are ponds or standing areas of water. Show students the diagrams of the wells and pumps on the Water in Africa site resource page.

3. Distribute the Health and Nutrition Stories by Peace Corps Volunteers serving in African Countries. (Alternatively, read the information from the Health and Sanitation stories on the Water in Africa site resource page.) If you wish to read more than those on the hand-out, focus on the vignettes relating to health and sanitation. As the class reads the vignettes, identify the various diseases mentioned as a list on the board. Those mentioned in the vignettes include Schistosomiasis, Cholera, Malaria, Amoebas, Giardia, Snails, Protozoa, Onchocerosis, and Typhoid Fever.

4. If you are using the Internet, have the students view the photos from various countries.

5. Discuss the comments of the Volunteers and their photos. Be sure to keep the discussion culturally sensitive and to underscore the economic reasons and the lack of infrastructure in obtaining clean water. Use what they have learned about ground water contamination in the previous days to connect with the stories and photos.

Procedure--Days Five and six

1. Tell the students to get into their small groups. Distribute the Poster Evaluation Rubric. As a class, go over the rubric and make sure students understand what is expected on their finished poster. Answer questions about the evaluation rubric.

2. Have students work in groups to research a particular disease from the list on the board. Students can utilize the Internet and library, and ask the school nurse to find information about the disease they have chosen. They should consider Cause, Symptoms, Treatment, and Prevention.

3. Tell the students that at the end of two class periods, each group should be ready to present a poster of the information they have found about their chosen disease. (See websites under resources below) The teacher will evaluate the finished product based on the evaluation rubric.

Procedure--Day Seven

1. At the beginning of class students should briefly describe what they learned about their disease and present their posters.

2. Following the discussion of the disease, students should re-read the vignettes. As you read as a class, discuss the diseases that are endemic in the African villages. Now that the students know more about the diseases, what suggestions can they make for improving the water issues in the villages? Why aren't some of these solutions taking place currently? (Hard work to collect wood, insufficient amount of wood, animals sharing water with people, people think solar heaters are strange, etc…)

3. Have students re-assemble into groups to brainstorm solutions for the villages that take into consideration the cultural and physical barriers that interfere with water sanitation.

Procedure--Day Eight

1. Work with the students to continue to brainstorm ideas for the first half of class. For the second half of class, have students work together as a class to draft a plan to decrease water-borne illnesses in the villages they read about. Students should imagine that they are submitting a plan to the World Health Organization, so all their ideas should be realistic, and professionally presented.

2. The teacher should be the writer, either writing class ideas on a piece of posterboard on the board, or typing the information into a computer that projects for all to see. Small groups should take turns sharing their ideas and the group as a whole decides whether or not they should be included in the final plan. Suggestions need to be realistic, for example you can't require a village to put up wire around the well if it is not available in the village.

3. Make arrangements for the plan to be presented or sent to water sanitation officials in your community, or returned Peace Corps Volunteers in your community. Ask this audience to respond to the students' suggestions.

Assessment

Informal formative assessment might include the observations of the groups as they work and the group discussions. For a formal summative evaluation, use the Poster Evaluation Rubric. Hshealth01sup02

Follow-up/Enrichment Activities

For students with stronger reading skills, don't limit the number of vignettes they can read to gather information, allow them to look at all the health and sanitation vignettes on the Water in Africa Web site.

Invite a doctor, the school nurse, or public health official to come in to class to talk about water-borne illness and answer student questions.

Additional Resources
Web sites about water-related illness:

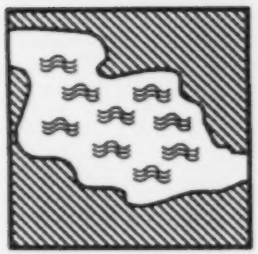
www.cdc.gov/ncidid/dpd/parasiticpathways/drinkingwater.htm
www.who.int/water_sanitation_health
http://www.discoveryhealth.com/DH/ihtIH/WSDSC000/20812/20812.html
http://dir.yahoo.com/Health/Diseases_and_Conditions/Tropical_Diseases/
http://www.chez.com/malaria/

About the Author

Carly Sporer Garrett was a Peace Corps Volunteer in Mongolia in 1995-96. She currently

teaches English and Reading at Palomar High School in Chula Vista, CA. She spoke about her reasons for creating this lesson: I decided to do a project involving water-borne illness, because I want my students to realize how fortunate they are to live in a country with abundant clean water, to increase their knowledge of disease transmission, and to show that solving problems is complex, that a solution is not as simple as it seems at first.

The Decision Process for Drinking Water.

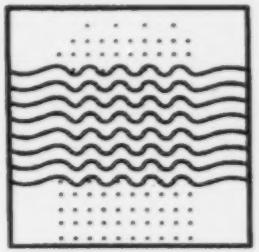


Source

- Does the drinking water come from lakes, rivers, or wells?
- How clean is the source?
- How much is there?
- How do we finance it?
- How do we protect it?
- What type of recreational uses are appropriate?

Transport

- How far must the water travel?
- Over what type of land?
- What is the cost to move it?

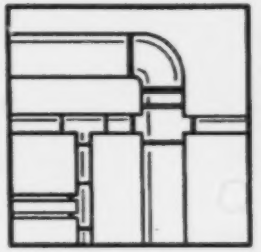


Treatment

- What type of treatment does the water need?
- Are the facilities adequate?
- How do we finance treatment?
- Is more research needed?

Testing

- What federal and state tests are required?
- How safe is the water?
- What must the public be told?



Delivery

- Where must the water go?
- Is the delivery system adequate?
- Does the system allow the community to grow?
- How is the system financed?

Home

- Do you ever run out of water?
- Do you have lead pipes or solder?
- Do you know how to reduce lead in your water?
- Do you waste water?
- How much do you value your water?

YOUTH ACTIVITY

Water Contamination Experiment

The following experiment is designed to help young people understand how drinking water counts on them to prevent water pollution.

Objective *Young people will create a miniature well so they can observe the effects of groundwater contamination.*
Taxonomy Level *Comprehension*
Time Needed *30 minutes*

Teacher's Notes

Approximately 53 percent of the population in the United States gets its water from underground aquifers. An aquifer is a geological (created by rocks) formation containing water. Like the holes in a sponge, an aquifer has openings or pores that can store water. Water for drinking is drawn up to the surface by a well or spring. The world's largest aquifer is the Ogallala Aquifer, which extends from Nebraska to Texas. Since water seeps down through soil into the aquifer, the soil filters the water.

Gasoline and other harmful liquids have been allowed to leak from underground storage tanks into the groundwater supply. Pollutants can seep into groundwater from poorly constructed landfills or septic systems. Groundwater can also be polluted by runoff from fertilized fields or livestock areas. Homeowners unknowingly contribute to ground-water contamination by dumping toxic chemicals down the drain or pouring them on the ground.

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RETURN TO PUBLIC AFFAIRS PAGE

RETURN TO AWWA HOME PAGE

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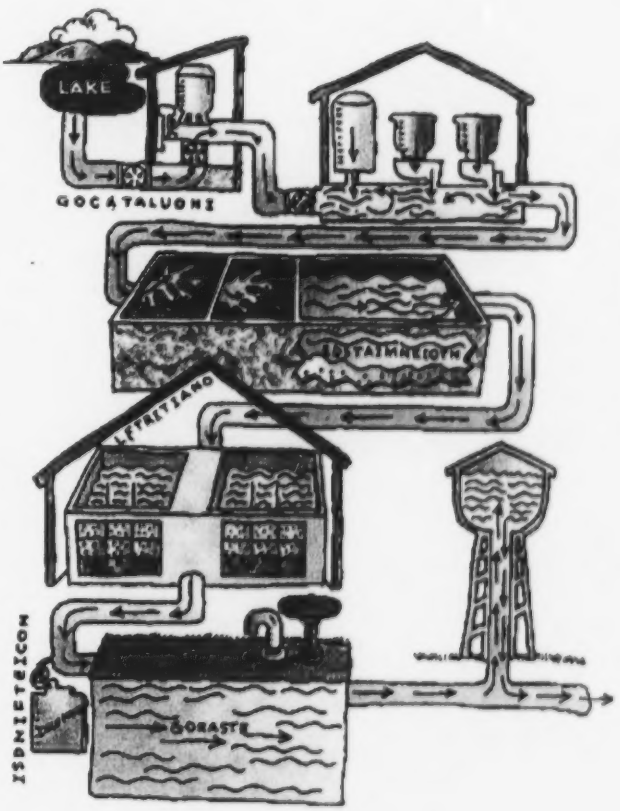
EPA United States Environmental Protection Agency
Office of Water

Ground Water and Drinking Water

Water Treatment Path

Follow a drop of water from the source through the treatment process. Water may be treated differently in different communities depending on the quality of the water which enters the plant. Groundwater is water located under ground and typically requires less treatment than water from lakes, rivers, and streams.

Stop at each treatment point and unscramble the words to show where the water is along the treatment path. **You may click on each treatment point on the image to see the unscrambled answer and a little information about that treatment point.**



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http://www.epa.gov/safewater/kids/treat.html

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ENVIRONMENTAL EDUCATION WATER FILTRATION

BACKGROUND: Water in lakes, rivers, and swamps often contains impurities that make it look and smell bad. The water may also contain bacteria and other microbiological organisms that can cause disease. Consequently, water from surface sources must be "cleaned" before it can be consumed by people. Water treatment plants typically clean water by taking it through the following processes: (1) **aeration;** (2) **coagulation;** (3) **sedimentation;** (4) **filtration;** and (5) **disinfection.** Demonstration projects for the first four processes are included below:

OBJECTIVE: To demonstrate the procedures that municipal water plants use to purify water for drinking.

MATERIALS NEEDED:

5 Liters of "swamp water" (or add 2 cups of dirt or mud to 5 liters of water)
1 Two liter plastic soft drink bottle with its cap (or cork that fits tightly into the neck
2 Two liter plastic soft drink bottles - one bottle with the top removed and one bottle with the bottom removed.
1 One and one half Liter (or larger) beaker or another soft drink bottle bottom
20 grams of alum (potassium aluminum sulfate - approximately 2 tablespoons; available in pharmacy or spice isle in grocery store)
Fine sand (about 800 ml in volume)
Coarse sand (about 800 ml in volume)
Small pebbles (about 400 ml in volume) (Hint: washed natural color aquarium rocks will work)
1 large (500 ml or larger) beaker or jar
1 coffee filter
1 rubber band
1 tablespoon
A clock with a second hand or a stopwatch

PROCEDURE:

1. Pour about 1.5 L of "Swamp Water" into a 2 L Bottle. Have students

describe the appearance and smell of the water.

2. **Aeration** is the addition of air to water. It allows gases trapped in the water to escape and adds oxygen to the water. Place the cap on the bottle and shake the water vigorously for 30 seconds. Continue the aeration process by pouring the water into either one of the cut-off bottles, then pouring the water back and forth between the cut-off bottles 10 times. Ask students to describe any changes they observe. Pour the aerated water into a bottle with its top cut off.

3. **Coagulation** is the process by which dirt and other suspended solid particles are chemically "stuck together" into floc so that they can be removed from water. With the tablespoon, add 20 g of alum crystals to the swamp water. Slowly stir the mixture for 5 minutes.

4. **Sedimentation** is the process that occurs when gravity pulls the particles of floc (clumps of alum and sediment) to the bottom of the cylinder. Allow the water to stand undisturbed in the cylinder. Ask students to observe the water at 5 minute intervals for a total of 20 minutes and write their observations with respect to changes in the water's appearance.

5. Construct a filter from the bottle with its bottom cut off as follows:

a. Attach the coffee filter to the outside neck of the bottle with a rubber band. Turn the bottle upside down and pour a layer of pebbles into the bottle - the filter will prevent the pebbles from falling out of the neck.

b. Pour the coarse sand on top of the pebbles.

c. Pour the fine sand on top of the coarse sand.

d. Clean the filter by slowly and carefully pouring through 5 L (or more) of clean tap water. Try not to disturb the top layer of sand as you pour the water.

6. **Filtration** through a sand and pebble filter removes most of the impurities remaining in water after coagulation and sedimentation have taken place. After a large amount of sediment have settled on the bottom of the bottle of swamp water, carefully - without disturbing the sediment - pour the top two-thirds of the swamp water through the filter. Collect the filtered water in the beaker. Pour the remaining (one-third bottle) of swamp water back into the collection container. Compare the treated and untreated water. Ask students whether treatment has changed the appearance and smell of the water.

Advise students that the final step at the treatment plant is to add disinfectants to the water to purify it and kill any organisms that may be harmful. Because the disinfectants are caustic and must be handled carefully, it is not presented in this experiment. The water that was just filtered is therefore unfit to drink and can cause adverse effects. It is not safe to drink!

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http://www.epa.gov/safewater/kids/filter.html

Health and Nutrition Stories

By Peace Corps Volunteers Serving in African Countries

Water pumped from the ground is fairly clean and free of rocks, dirt, mud, and mildew. But it's not free from microbes and viruses that are too small to be seen by the eye. This is why I filter and add bleach to my water. Using iodine tablets or boiling water are also good methods to ensure safety for cooking and drinking. Bathing water comes directly from the pump or barrage with no filtration treatment.

Many diseases can be carried in water, and one of them is Guinea worm. Burkina Faso is waging a national effort for the eradication of the Guinea worm. We're actually pretty lucky--a double layer of thin fabric is enough filter to stop Guinea worm from entering water stored in a bidon, canary, bareek, or other container. Each month, I go to the tiny satellite villages near Pensa to hand out filters and conduct hands-on training demonstrating their use. One village, Yalgo, has almost 40 cases of Guinea worm, making it an endemic area. It is a tragedy because Guinea worm is very easy to prevent. But children and adults with Guinea worm have difficulty walking, working, and farming. They're also susceptible to tetanus and other infections and can easily infect other village water supplies. Guinea worm education in conjunction with water treatment training can be a very effective way to create a lasting, positive change in a village.

By **Jonathan Coleman**, Pensa, Burkina Faso

No, my drinking water is not "fresh"—it is contaminated with amoebas, snails and Schistosomiasis. The children are constantly sick with different water born illnesses. My neighbors know that they should boil their water to kill these critters and prevent their families from getting sick, but that takes time and energy (find the wood, start the fire, boil the water…) Not to mention that they would need to boil water for ten to fifteen people, the average family size here! So they don't do anything and they continue to get ill. The water pump at the health center has been chlorinated and is safe to drink, but it is far from town where everyone lives, and we have to pay to take water from there. However, the price to take water for a month is less than one day of medicines to treat amoebas.

By **Karen McClish**, Belita II, East Province, Cameroon

The drinking water in Guinea is likely to be contaminated with any number of parasites—the most common among PCVs are Giardia and amoebas. I have had protozoa, and there have been cases of schistosomiasis. Conakry, the capital, has had two outbreaks of cholera in the last year. These diseases are mostly gastro-intestinal and can cause diarrhea. This is the leading cause of death among children in the region. Stagnant water is the breeding ground for mosquitoes, which transmit malaria, another killer of many people. The black biting flies that transmit onchocerosis—a leading cause of blindness—live around rivers. There are no programs in place to ensure clean drinking water in my village. Families drink pump water when it is available.

By **Shad Engkilterra**, Banko, Guinea

Health and Nutrition Stories

By Peace Corps Volunteers Serving in African Countries

My water usually comes from a spring that is protected and well-maintained by the Kenya Red Cross so it should be fairly safe drinking water, however I still boil my water and then filter it. Most of the families in my area boil their water for drinking.

Since I've been Oyugis, there has been a small outbreak of typhoid fever, which comes from water. There has also been a cholera outbreak. Cholera causes severe diarrhea and it can lead to death within a few days. This affects people in the very rural areas more often.

By **Melissa Perry**, Oyugis, Kenya

According to Mr. Mukusay, the nurse in charge, 60-70% of the people here in Gumica have Bilharzia (Schistosomiasis). We also have a problem with malaria during the rainy season and with cholera because thieves stole wire fencing around the borehole. The fencing prevented domestic animals from coming close and contaminating the water. The only borehole with fencing is the Dakote River borehole, but goats seem to be able to get through. Last year several people died from cholera, but the community took no action. As far as nutrition is concerned, Gumira is not scoring any points, as food is very limited in variety. We mostly eat "sadza," a corn mush with the consistency of mashed potatoes with no flavor and almost no nutrition. Sadza is eaten with a green leafy vegetable called "rape" and if you can afford it, goat. If you are rich you could get beef or chicken. Whenever I cook "American" (or as they say, "European") people are always amazed by the fact that there is taste. People don't seem to eat for pleasure here, but only to survive. Boiling water from Save would probably result in the best tasting drinking water around. Great idea, but this would be cost prohibitive since during the war most of the trees were cut and all firewood is imported from the mountains. The mountains are currently running out of wood also, so firewood has become very expensive. Solar cookers could help lessen this problem however, people here are extremely afraid of witchcraft (Eastern Zimbabwe, especially Chipinge District). Cooking with a box and no fire is too strange. Gas is also a good alternative but everyone is afraid of being blown up. Solutions are never easy.

By **Robert Joppa**, Gumira, Chipinge District, Zimbabwe

The bore holes in the town provide safe drinking water. However, many people (especially older people) don't like the taste of the bore hole water. They grew up drinking river water-"its sweet for them"-and it's when their forefathers drank. It takes time to develop new habits and the bore holes have been in the village for only two years. However, those that still drink river water sometimes boil it-this kills all living germs in it. Drinking water is stored in clay pots inside people's rooms. They keep it covered, and the clay keeps the water cool.

The most common cause of contamination to the river water is human waste. Because there is a lack of latrines in the village many people defecate by the river. Rain carries feces into the water and diseases are spread.

Bilharzia is one of the most common diseases found in this part of Ghana. Worms breed in snails, which live in the weeds and then enter a person. A person who urinates in the water will pass eggs back into the river, creating a cycle. One of the primary symptoms is urinating blood.

by **Nell Todd**, Mafi-Dove, Ghana

There are two bore holes in my community that provide clean water, ready for consumption. This promise of clean water leading to good health is still not a strong enough argument to convince everyone in the community to use the bore holes. All previous generations

drank from the river. Some of those ancestors lived to be one hundred years old while others died young from causes that had nothing to do with water. It's a tough argument. However, now the residents of Gbefi have a choice as to where they will fetch their water. As community and government health initiatives increase, the choice will become easier. Clean, clear bore hole water from one hundred meters below, or the River Dayi with run-off from the farm, soap suds from the laundry, and plenty of dirt.

The biggest obstacle to increasing clean water accessibility is the cost. This modern, state of the art hydro-technology greatly exceeds the budget of subsistence farmers. Yet I think accessibility is the key. If fetching from a bore hole is easier and more convenient than fetching from the river, everyone will do it without a second thought. Compare it to recycling in the United States. Recycling is beneficial to the environment; no one can argue that. However, fifteen year ago, it was a chore to recycle. You had to store it all in your house until you had time to deliver it to recycling centers. Aluminum went one place, glass to another, paper to a third etc., so the process would take up at least a half of your day. But then came curbside pickup just like the garbage and color coded recycling bins outside of grocery stores. Suddenly, someone who never considered recycling fifteen years ago, is now doing it faithfully. It became easy and convenient to recycle. I believe the same would be true for clean drinking water in Ghana.

by **Amy Wiedemann**, Gbefi, Volta Region, Ghana

I am a very lucky Peace Corps Volunteer. I live near KPONG Water Treatment Facility so all my water comes from there. This is due to the fact that I live near the school. Even though my water's fluoride levels fluctuate I have never fallen ill due to contaminated water at my site. PCV Vikki Sturdivant was not as lucky as I was with respect to water. Her water source was initially from Lake Volta. The water was contaminated and unpalatable if not polluted. She has had tests on the water and found it contained Shigella, bacteria (of all sorts), and schistosomiasis. Obviously the impact on Ghanaians health is severe. If a worker in the family becomes ill, then it affects the entire family. In some areas water is treated or filtered but hopefully in the near future they will have bore holes to provide water.

I definitely prefer my insipid water to rancid disease carrying water.

by **Steve Tester**, Odumase Krobo, Ghana

Evaluation of Water-Borne Illness Poster

Group Name_____

Group Members _____

Area	Points	Descriptors
Content Accuracy	/40	The group included information on environmental and external factors that affect individual and community health: • Causes of selected disease • Symptoms of selected disease • Treatment of selected disease • Prevention of selected disease
Content Depth	/20	The group • Displayed an understanding of the social, economic and political effects of a water-borne illness on individuals, families and communities: • Described all aspects of the disease completely • Used a variety of sources to compile the information
Process	/20	The group: • Worked together to create a final product • Assumed responsibility for finishing product in allotted time
Presentation and Neatness	/10	The group: • Completed a poster that is neat and organized
Creativity	/10	The group: • Produced a creative and interesting poster
Total	/100	

Comments:

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